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PCT/CN99/00200

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PRIORITY DATE CLAIMED

23 November 1998 (23.11.98)

TITLE OF INVENTION

## INTEGRATED INFORMATION SERVICE PLATFORM SYSTEM AND METHOD THEREOF

APPLICANT(S) FOR DO/EO/US

YIHUI DENG

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☒ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

## Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail
23. ☐ Other items or information:

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR <b>09/856439</b>		INTERNATIONAL APPLICATION NO. <b>PCT/CN99/00200</b>		ATTORNEY'S DOCKET NUMBER <b>DEQ1-0002-US</b>	
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24. The following fees are submitted:

<b>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):</b>		<b>CALCULATIONS PTO USE ONLY</b>		
<input checked="" type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO .....	<b>\$1000.00</b>			
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO .....	<b>\$860.00</b>			
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....	<b>\$710.00</b>			
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<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) .....	<b>\$100.00</b>			
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>		<b>\$1,000.00</b>		
Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)). <input type="checkbox"/> 20 <input type="checkbox"/> 30		<b>\$0.00</b>		
<b>CLAIMS</b>	<b>NUMBER FILED</b>	<b>NUMBER EXTRA</b>	<b>RATE</b>	
Total claims	40 - 20 =	20	x \$18.00	<b>\$360.00</b>
Independent claims	2 - 3 =	0	x \$80.00	<b>\$0.00</b>
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>				<b>\$0.00</b>
<b>TOTAL OF ABOVE CALCULATIONS =</b>				<b>\$1,360.00</b>
<input checked="" type="checkbox"/> Applicant claims small entity status. (See 37 CFR 1.27). The fees indicated above are reduced by 1/2.				<b>\$680.00</b>
<b>SUBTOTAL =</b>				<b>\$680.00</b>
Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). <input type="checkbox"/> 20 <input type="checkbox"/> 30 +				<b>\$0.00</b>
<b>TOTAL NATIONAL FEE =</b>				<b>\$680.00</b>
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). <input checked="" type="checkbox"/>				<b>\$40.00</b>
<b>TOTAL FEES ENCLOSED =</b>				<b>\$720.00</b>
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a. ☒ A check in the amount of **\$1,400.00** to cover the above fees is enclosed.

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c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **20-1504**. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

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REGISTRATION NUMBER \_\_\_\_\_

**May 22, 2001**

DATE \_\_\_\_\_

12/PATS

## **Integrated Information Service Platform System and Method thereof**

### **Field of the Invention**

The present invention relates generally to information processing technology field, and more particularly to an integrated information service platform and its method used for electronic commerce solution.

### **Background of the Invention**

At present, with the development of information technology, the world is going into the information era. The electronic commerce becomes increasingly a part of the human life.

The electronic commerce should be consisted of telecommunication service, computer network service, business service and consumer. The traditional business service mode should be developed. The relationship among the traditional telecommunication service provider, the business service provider and the consumer is changing.

In the electronic commerce era, the telecommunication service should be effective, simple and flexible. On the one hand, accompanying a lot of new technology is used, the basic facilities of the telecommunication: transmission and exchange have been great developed. This makes the telecommunication possible to create deeper service. The combining of computer network technology and telecommunication technology provides value-added services and implements the electronic commerce. On the other hand, the business service provider and consumer have proposed more service requirements to the telecommunication service. The requirements include giving the business service provider the possibility to increase the service content and service means rapidly and easily, giving the user to get the needed service with any terminal. In addition, the communication facility is going to convergence. The telecommunication network, broadcast and television network and computer network will be converged. Based on the IP technology, the information and service business will be united more rapidly, and will become more important.

In the electronic commerce era, the business service will be specialized with electronics. The new technology of computer network and telecommunication network makes many traditional commercial service providers, such as department store and financial and security service institutes etc., enter the electronic commerce field. As lack of professional and the press of competition, the commercial service providers can only concentrate their attentions to the business development. They will outsource the electronic commerce to other service providers. The commercial service provider must assign and renew business according to the market rapidly changes.

Consumer is the key for the success of electronic commerce. On the one hand, consumer needs to use all kind of terminals to get the information and service for the consuming purposes. On the other hand, the group of consumers and their requirements are changing. Except the traditional consumer, the business service providers provide service mutually, which forms a service chain, and the business service provider oneself becomes a new consumer group.

User is the one who enjoys the various services provided by the platform and is capable of implementing various operations with the platform. This includes individual user, resident user, government staff, company and organization etc. These kinds of user are huge. Their skill of using computer is quite different and their service requirements are quite different too.

At present, on the one hand from the user's point of view, the service has a distance apart from the electronic commerce. The user doesn't like to go to the service provider's serving site. The user, at same time doesn't accept the electronic serving mode completely. Many of the services, which are closely related to the diary life, are offline. The online services now are distributed and fragmentary. Various kinds of terminals have not been used sufficiently and the access means are lack of compatibility. On the other hand, in order to acquire information and provide service, the service provider spends a lot of money and human resource to create and maintain the hardware and software needed.

Specifically speaking, at present there are various communication transmission networks between user and the service provider, such as PSTN, ISDN, X.25, Frame Relay, DDN, ATM, xDSL, CATV and wireless data network etc. These networks are used for accessing, transferring requirement and returning the response.

The traditional information service mode has the following problems.

The earliest information service system is the terminal-mainframe mode. This mode is one layer of architecture. The mainframe is responsible for all the business processing. The terminal performs only the input/output job of the operation. All the application systems are created around the mainframe. Therefore, the portability and compatibility of the application system are worse, and it is necessary a special maintenance.

Later, the two layers architecture of the application system appears. This is so-called Client/Server mode. A complete program of the application system is consisted of the server program and client program, which operate on the server and client computer respectively. In this mode, the development of application system is individual, so each application system is mutually independent. Thus, repeated coding and large volumn of maintenance jobs result in resource wasting and low efficiency. The Internet uses browser to access all the services in the network, but it does not solve the creation problem of application system in the server.

With the mode said above, each service provider must have a complete set of communication facilities, create the application software himself and keep a maintenance force in routine operation. This wastes the social resource. In addition, as a service provider has only limited communication facilities, when a lot of users visit a service provider, there will be block and congestion.

Usually, a user needs many different services provided by different service providers. In this case, the user has to install multiple application client software in his computer and learn to use all software and interfaces. This will give the user additional troubles.

IBM disclosed a solution to integrate the telephone switching system in the WAN or

LAN at his patent EP97111728 (applied on 10th, July 1997, the title is "Control of a telephone switching system over a digital information network"). The solution doesn't solve the problem said above, and does not support the integrated service among multiple providers and large volume of users with different access mode.

### Summary of the Invention

Pointing to the problems said above, the invention provides an integrated information service platform and method for united access, united management and united application. It is a total solution for the electronic commerce. It is based on the telecommunication and other public communication platform. It is an intermediate layer to provide information service and exchange to service providers and users. The platform system will get so-called 6A, i.e. Anytime, Anywhere, Any access, Any content, Any service and for Any body. This means that at any time, in any place, with any access mode, anyone can get any information and any service, i.e. ANY-TO-ANY.

The invention provides an integrated information service platform system. The platform system includes access unit, management unit and application unit. These three units are connected with each other through transmission network.

The access unit connects user and the various service provider systems through transmission network. It supports user to access the system with multiple modes and identification. It receives the user requirement proposed through the transmission network and transforms the requirement to a unified data format.

The management unit uses a uniform identified interface to manage and control the operation of each part of the platform system. It receives the data in uniform format come from the access unit. It authenticates a user identification and authorization.

The application unit includes at least one middleware, which is used to execute a specific processing function. The application unit selects adequate middleware to deal with a requirement and returns the result to the user, who proposes the requirement.

The platform system is based on Internet or Intranet. The unique data format, said

above, can be the IP protocol data or other protocols data. The said management unit includes multiple management middleware, which are responsible to deal with the basic management function, which is common to all services. The said access unit includes multiple access middleware, which are used to process the problem related to the access terminal. The said application unit includes multiple service middleware, which executes the specific service processing and produces the processing result.

The invention also provides a method for the integrated information service platform. It includes:

- Access by multiple users with various access modes, receive requirements from user terminal through transmission network, transform the requirement into a uniform data format, and connect to service provider through transmission network.
- Manage and control the application and operation with an identified interface, receive the data with unique format, authenticate a user identification and authorization.
- Provides at least one middleware, each of which implements a specific application processing function; select adequate middleware for each requirement proposed by the user. The middleware has passed the authentication and return the processing result to the user.
- The platform is based on the Internet or Intranet and the said uniform data format can be IP protocol data or other protocols data.

The platform system, which takes the information and service as its center, removes the limitations of time, area and access mode from the business service provider and consumer and implements 6A or ANY-TO-ANY. The platform system implements identified access, identified management and identified application.

The identical access solves the access problem of various kinds of service provider. On the one hand, the service provider doesn't like to spend too much money and effort to solve access problem. On the other hand, they hope as many users as possible to access their system. The consumer also hopes that they have more access mode to enjoy the

service provided by the service providers. In implementation, the platform system connects public and private networks, including telecommunication network, broadcast and television network and computer network, through standard interface. This makes user in different networks can communicate with each other. The terminals also can share the information services in each network. The platform system implements identical information exchange and service.

As the user is under different condition and in different environment, different kind of user accesses to the platform system should be in a different mode. It is possible at different time the same user accesses to the platform system with different mode. Even at the same time in some situations, a user would like to access the platform system with different access mode. Therefore, it is impossible to hope that different terminal accesses the platform system with the same network and different terminal can receive and deal with same format information. In the platform system, no matter what mode the user accesses the platform system, any user requirement is transformed to a unified data format after the user identification has been authenticated. The unique format data are transferred to service provider to process. The result is returned to the platform system with a unique format and is transformed into different form, which is adequate to the user terminal, which proposes the requirement.

The identical management solves the management problem of user and system resource. On the one hand, the user identification and authorization is authenticated once with an identified procedure and account of service is done with an identification standard. On the other hand, the system hardware equipment and software application are configured, maintained and managed in a concentrated form.

The system resource includes user, service provider, network equipment, terminal and application etc. From the platform system points of view, different user object is only with different attribute. In addition, the platform system uses browser as the unique user interface. Identical management can make the system operation automatically and remote maintenance easily.

The so-called identical application solves the complicated and different application



problem. The immense variety of service requirement makes the application development to be a bottleneck of the information service. Internet uses browser to access all services, but it doesn't totally solve the application development problem. The platform system creates a mechanism to rapidly develop the application, which adapts for variety of terminals and transforms protocol and data format automatically.

### The Drawings

Figure 1A shows a structure diagrammatic drawing of an embodiment of integrated information service platform system of the invention.

Figure 1B shows the diagrammatic drawing of an embodiment for interconnection of multiple integrated information service platforms at the metropolitan area level.

Figure2 shows the system diagrammatic drawing of an embodiment of the integrated information service platform system of the invention.

Figure3 shows a structure diagrammatic drawing of each unit of the integrated information service platform of the invention.

Figure4 shows the diagrammatic drawing of unit logical structure of the integrated information service platform.

Figure5 shows the logical structure diagram of the integrated information service platform in unit module level.

Figure6 shows the diagrammatic drawing of the access unit logical structure of the integrated information service platform of the invention.

Figure7 shows the dialing access diagrammatic drawing of an embodiment of the integrated information service platform of the invention.

Figure8 shows the leased line access diagrammatic drawing of an embodiment access unit in computer network of the integrated information service platform of the invention.

Figure9 shows the diagrammatic drawing of an embodiment access unit in the broadcast and television network of the integrated information service platform of the invention.

Figure10 shows the access unit ACU connection diagrammatic drawing of an embodiment of the integrated information service platform of the invention.

Figure11 shows a logical structure diagrammatic drawing of an embodiment management unit of the integrated information service platform of the invention.

Figures 12A-12B show the mutual relationship between management modules and the console of an embodiment management of the integrated information service platform of the invention.

Figure 12C shows an example diagrammatic drawing of a software structure of the management unit.

Figure13 shows a diagrammatic drawing of the equipment connection of an embodiment management unit of the integrated information service platform of the invention.

Figure14 shows the logical structure diagrammatic drawing of application unit of an embodiment of the integrated information service platform system of the invention.

Figure 15 shows the diagrammatic drawing of the application unit equipment connection in an embodiment of the integrated information service platform system of the invention.

Figure 16 shows a diagrammatic drawing of the application layer structure in an embodiment of the integrated information service platform system of the invention.

Figure17 shows a diagrammatic drawing of characteristics of the middleware set in an embodiment of the integrated information service platform system of the invention.

Figure18 shows a flowchart of the business service on the integrated information

service platform system of the invention.

Figure 19 shows a diagrammatic drawing of an embodiment on three city platforms.

In the following, the optimized embodiments of the invention are described in detail with the drawings.

### Detailed Description of the Invention

Figure 1A shows a structure diagrammatic drawing of an embodiment of integrated information service platform system 10 of the invention. It consists of three parts: Access Unit (ACU) 101, Management Unit (MAU) 102 and Application Unit (APU) 103.

The access unit (ACU) 101 implements the network access and gateway transformation. ACU is a distributed communication system. Through different transmission networks, such as telecommunication network, broadcast and television network and computer network etc., it connects the business service provider and customer with the integrated information service platform. It also implements the protocol transformation of non-data access network, such as voice/data (TCP/IP) and data (TCP/IP)/voice etc. ACU is also used for interconnection between integrated information service platforms, and between integrated information service platform and existing ISP.

The management unit (MAU) 102 implements the management of the integrated information service platform. MAU is a distributed integrated management system. Through the integrated management structure, it manages the system resource and business resource of the integrated information service platform, such as network management, system management, customer management and accounting management etc.

The application unit (APU) 103 implements the integrated application environment of the integrated information service platform. APU is based on TCP/IP protocol. It is an open system and supports multi-layer Client/Server architecture. It implements rapidly the business outsourcing and agent application access. Authorized by the MAU, the business service provider can use all the access mode and terminals of the integrated

information service platform to provide service to all user. The user can also select different access mode and terminal to enjoy all the services provided by the integrated information service platform.

Figure 1B shows the diagrammatic drawing of an embodiment for interconnection of multiple integrated information service platforms 10 at the metropolitan area level. As shown in Figure 1B, the integrated information service platform 10 is an open and linearly expandable system. Its three units can be expanded according to the requirement respectively. Every unit makes cascade connection by network exchange matrix. Two or multiple integrated information service platforms at metropolitan area level can be connected by access unit (ACU) 101 to form a integrated information service platform with larger covering area and more services.

In each city, the integrated information service platform is established based on the existing communication infrastructure and interconnected with communication network. With its expandability, it can cover the whole country or even beyond the boundary, and its service area is unlimited. It's better to take metropolitan area as the basic service unit in the construction and operation of the platform system. Through the interconnection of the integrated information service platforms in different area or through the interconnection between the integrated information service platform and other service networks, the roaming service beyond a metropolitan area is implemented. By constructing the local service system of the integrated information service platform, the local communication infrastructure can be sufficiently used, access fee of the user can be decreased, and influence and economic benefit can be raised.

Figure2 shows the system diagrammatic drawing of an embodiment of the integrated information service platform system of the invention. As shown in Figure2, the access unit 101 of the platform system is connected to computer network, to telecommunication and telephone network and to broadcast and television network through transmission network. Wherein the notebook PC and desktop PC is accessed through computer network, the telephone and facsimile are accessed through telecommunication and telephone network. Also home PC, PDA and palm PC is accessed

through modem and telecommunication and telephone network, telephone, home PC and TV is accessed through STB (Set-top box) on CATV network. On the other hand, the access unit 101 is connected with various service provider systems to transfer data. Example of the service provider system is such as stock exchange and information service system, real estate trading and information service system, government organization system and other business service system. The access unit 101 implements also the gateway transformation. It transforms all user requirements into a uniform data format, which can be based on IP, such as IP data, or other protocol data.

The management unit (MAU) 102 of the platform system uses an identical interface to manage and control resources, and it authenticates a user identification and authorization. The application unit (APU) 103 provides basic service, outsourcing service and agent service. For basic service and outsourcing service, after passing the authentication of the user identification, the application unit 102 selects the adequate application middleware to process the said service requirement, and returns the processing result to the user through access unit 101 and transmission network. For agent service, after a preliminary processing, the application unit 102 transfers the user requirement to the adequate service provider system, and returns the processing result of the service provider system to the user. Wherein the access unit 101, management unit 102 and application unit 103 are connected with each other for data transmission.

Figure3 shows a structure diagrammatic drawing of each unit of the integrated information service platform of the invention. Each unit of every integrated information service platform is consisted of three modules: processing module 201, information exchange module 202 and power supply module 203. The processing module 201 is responsible for the processing job of the unit. The information exchange module 202 is responsible for communication within the unit and communication with the other two units. The power supply unit 203 is responsible for the power distribution, power blackout protection and cooling in the unit.

The information exchange module 202 provides interfaces with Ethernet (10M), high-speed Ethernet (100M) and thousand of million Ethernet (1000M). At the same time,

it provides the interface capability for upgrading to 155M and 622M ATM (Asynchronous Transmit Mode). The power supply module 203 provides 220V ~ 240V, 50/60Hz a. c. power. The information module 202 and power supply module 203 are common modules for all units.

Figure4 shows the diagrammatic drawing of unit logical structure of the integrated information service platform. It shows the logical relationship between units. As shown in Figure4, the ACU 101 is responsible for network communication and gateway, it connects the business service provider and business service consumer to the integrated information service platform. MAU 102 is responsible for management of the integrated information service platform including the authentication and authorization of the user and service provider etc. APU 103 provides specific services including basic service, outsourcing service, agent service and navigation service etc.

The user proposes the service requirement to the integrated information service platform through the ACU 101. The MAU 102 authenticates the user. If it is the outsourcing business service of the business service provider or the basic service of the integrated information service platform, APU 103 is authorized to provide the service to the user; otherwise an adequate service provider is authorized to provide the service through the application integrated module AIM in application unit APU.

Figure5 shows the logical structure diagram of unit module of the integrated information service platform. As shown in Figure5, when the user accesses to the ACU 101 of the integrated information service platform, at first the access network protocols of various different terminals are transformed to a unique protocol such as IP protocol; then, the service requirement is transferred to MAU 102 for authenticating the user identification. Secondly, the MAU 102 authorizes the user. Finally, the APU 103 provides the individual service to the user according to the user authorization given by the MAU 102. The structure and function of each module in each unit will be discussed in detail below.

The MAU 102 collects management information from APU 103 and ACU 101. It includes access accounting, service accounting, network and system management

information etc. If the accounting information is provided by business service provider, it will be given by the business service provider.

Figure6 shows the diagrammatic drawing of the access unit logical structure of the integrated information service platform. As shown in Figure6, the access unit includes information exchange module 202, processing module 201 and power supply module 203. The information exchange module 202 is responsible for the connection of the network equipment in the unit, and network connection with other units. The power supply module 203 is responsible for the power supply of all equipment in the unit. The processing module 201 is the kernel component of the unit. The ACU processing module is divided into two parts: communication network access processing and gateway transformation processing. Specifically, the ACU is consisted of the information exchange module (NSM), the terminal access module (TAM), the network access module (NAM), the leased line access module of data network (LAM), the voice/data transformation module (VDM), the facsimile/data transformation module (FDM), the data service module (DSM) and the power supply module (PSM).

As shown in Figure5 and Figure6, the communication network access processing part provides various type network interfaces to implement various communication network accesses. The communication network access processing part of the ACU includes terminal access module (TAM), leased line access module of data network (LAM) and network access module (NAM).

The TAM is used to access the personal terminals such as telephone, facsimile and personal computer etc. The LAM is used to access the computer network based on TCP/IP protocol or ATM protocol. The NAM is used to access the broadcast and television network using HFC. Table 1 shows the configuration of the ACU access-processing module.

Table 1 ACU access processing module

Sequence No.	Module	Access Network	Access Terminal
1	TAM	telecommunication and telephone network	computer, telephone, facsimile

2	LAM	computer network	computer, computer network
3	NAM	broadcast and television network	computer, computer network, television

The gateway transformation part provides various heterogeneous networks transformation. The ACU gateway transformation part includes voice/data transformation module (VDM), facsimile/data transformation module (FDM) and data service module (DSM).

The VDM uses the telephone as the information terminal of the integrated information service platform. It implements the transformation between voice and network data of the integrated information service platform. It transforms the DTMF signal comes from telephone into the command and request based on the TCP/IP, and translates the result into voice for sending back to the user.

The FDM uses the facsimile as the information terminal of the integrated information service platform. It implements the transformation between facsimile and network data of the integrated information service platform. It transforms the DTMF signal comes from facsimile and the G3/G4 facsimile command into the command and request based on TCP/IP, and translates the result into G3/G4 facsimile for sending back to the user.

The DSM uses the computer as the information terminal of the integrated information service platform. It implements the computer or computer network accesses. Table2 shows the configuration of the gateway transformation-processing module of the ACU.

Table2 ACU gateway transformation-processing module

Sequence No.	Module	Transformation	Adequate Terminal
1	VDM	Voice/data transformation	Telephone
2	FDM	Facsimile/data transformation	Facsimile
3	DSM	Data service	Computer

Table3 shows the module characteristics of access unit ACU.



Table3 ACU characteristics table

Characteristics	Interface	Usage
NSM	10*100 Base-T	Connect APU, MAU
TAM	16Xe1	Access voice service, facsimile service and dial data service
NAM	E1,V35Ethernet	Access broadcast and television network
LAM	E1,V35Ethernet	Access computer network
VDM	5xE1	Voice/data transformation service
FDM	1xE1	Facsimile/data transformation service
DSM	E1,V35Ethernet 100Base-TATM	Data service
PSM	220V	ACU power supply

The access mode of ACU unit is divided into three access modes according to the access user attribute. They are dialing access, computer network leased line access and broadcast and television network access. The three access processing modules process them respectively and are described in the followings.

Figure7 shows the dialing access diagrammatic drawing of an embodiment access unit of the integrated information service platform of the invention. As shown in Figure7, the access mode is dialing access, supports PSTN/ISDN dialing. The user uses telecommunication and telephone dialing network and is processed by the TAM. According to the different user terminal, the TAM transfers to the adequate gateway automatically. If the user terminal is a telephone, then the TAM transfers to VDM gateway. If the user terminal is a facsimile, then the TAM transfers to FDM gateway. If the user terminal is a computer, then the TAM transfers to DSM gateway. The access port uses E1, also supports standard access port of V5.1 and V5.2 access network.

Figure8 shows the leased line access diagrammatic drawing of computer network of an embodiment access unit of the integrated information service platform of the invention. As shown in Figure8, the access mode is computer network with leased line access, and the user uses DDN/FRN/PSDN data network; they are processed by the LAM. The LAM transforms telecommunication port to terminal equipment port and connects to DSM. The access point supports the wide area port.

Figure9 shows the diagrammatic drawing of the broadcast and television network access of an embodiment access unit for the integrated information service platform of the invention. As shown in Figure9, the access mode is the broadcast and television network access. Except using the data network leased line, in general the user accesses directly with optical fiber. The protocols generally used are Ethernet, high speed Ethernet, FDDI and ATM etc. They are processed by the NAM. The main terminals of broadcast and television network access are TV and computer. In general, they are accessed by the head-end of local cable television station of the broadcast and television network. They support typical ports of wide area network and local area network.

The connection between the service provider system and the ACU 101 uses the computer network access mode, said above. It uses the data leased line network, which can be a virtual leased line network.

All of the connection between ACU unit and other units is based on network protocol, mainly the TCP/IP, but with the capability of using other network protocol such ATM and IPX etc.

ACU connects with user and service provider through NAM, LAM and TAM, and connects with other units of the integrated information service platform through information exchange module (NSM).

Except connecting with the internal equipment, the NSM can connect with other external units. It can also be used for ACU cascade connection in order to expand the system capacity and processing capability.

With the type, the access is divided into three modes: dialing relay access, leased line access and fiber access.

The dialing relay access applies digital circuit. Its typical interface is E1 or V5 (V5.1 and V5.2) interface. It includes voice signal and calling signal, which are provided by the exchange of the telephone companies and are accessed to ATM. The output of ATM provides to VDM, FDM and DSM, and the output port is E1, if it is necessary, the

artificial seat can be accessed.

The leased line access applies wide area network leased line access. The typical interfaces are PSDN/DDN/FRN/ATM, the transmission rate is E1 or Nx64k, or even E3, OC-3 etc. The access modules used are NAM and LAM, and their output is connected to DSM. The main network protocol used is TCP/IP, but other protocols, such as ATM, IPX and SNA etc., are supported.

The fiber access transmits the digital information through optical fiber. The information can be multimedia information through such as the HFC and CATV network, also it can be network information, such as through SDH fiber ring or DDN optical fiber. It supports high speed and large capacity transmission, and the transmission rate can be over 34M (E3). It is directly connected with the high-speed port of the DSM.

The ACU can be consisted of one unit or multiple units. When it is consisted of multiple units, the cascade connection between units is through the NSM of each unit. In this way, an access group is formed. Only through the information exchange module, the connection between access group and other units of the platform can be set. In this way, the capacity of the platform system is easy to be expanded, and a large volume of user can be accessed.

Figure10 shows the equipment connection diagrammatic drawing of access unit ACU of an embodiment of the integrated information service platform of the invention. As shown in Figure10, NSM is connected to the internal equipment of ACU, at the same time it provides the network interface to be connected to MAU and APU. There are two types of NSM: NSM2000 and NSM5000. The NSM2000 applies the Cisco's Catalyst2900 Ethernet exchange, and supports 24 10M/100M exchange interfaces. The NSM5000 applies Cisco's Catalyst5000 and supports up to a hundred of 10M/100M exchange interface, and is capable of upgrading to 1000M exchange interface and ATM exchange interface (155M or 622M). It can implement exchange of ATM port and Ethernet port.

The TAM is an intelligent queuing machine, Excel or Summa4 programmable

intelligent queuing machine can be selected. There are two types of TAM: TAM2000 and TAM4000. TAM2000 selects Excel programmable intelligent queuing machine, it supports up to 2000 lines. TAM4000 selects Summa4 intelligent queuing machine, it supports up to 4000 lines and is configurable. The two types all support No.7 signaling SS7.

There are two types of VDM: VDM120 and VDM300. The VDM120 is consisted in an industrial control PC, which is installed with Pentium CPU, Window NT operating system, and 4 pieces of E1 voice card made by Dialogic Company; it supports 120 lines and China No.1 signaling. The VDM300 is a high availability voice processing system based on a SunSPARC workstation, it can install 1-13 pieces of E1 voice card made by Dialogic Company, and supports up to 390 lines.

There are two types of FDM: FDM30 and FDM120. The FDM30 is consisted in an industrial control PC, which is installed with one E1 facsimile card, and supports 30 lines of facsimile. The FDM120 can be got by expanding the FDM30, and be installed with 4 pieces of E1 facsimile card.

There are two types of access server of DSM: DSM120 and DSM720. The DSM120 is the ASS800 access server made by Cisco and supports up to 720 lines.

There are two types of DSM leased line access module: DSM7000 and DSM10000. The DSM7000 applies large router Cisco 75000, and it can support 64K-155Mbps port and can be configured according to the specific application situation. The DSM10000 applies the Cisco's GSR12000 backbone router, and supports 155M-622M port; its port can be configured according to the specific application situation.

There is a type of NAM: NAM3000. The NAM3000 is a DDN node exchange, Main street3600 made by a Canada New Bridge Company, and accesses the port with a lower than E1 speed. The port with a higher then E1 speed is directly accessed to the adequate port of DSM with fiber. The connection port between NAM3000 and DSM is E1 and E3. The LAM is same as NAM.

There is only one type of PSM: PSM50000. It applies 5KW rack UPS made by

APC Company. It provides ACU with uninterrupted, stable and pure 220V AC power.

Table4 shows the hardware configuration of the access unit of an embodiment.

Table4 ACU hardware configuration

Equipment Name	Type	Configuration
NSM	2000	CISCO CATALYST2900
NSM	5000	CISCO CATALYST5000
TAM	2000	Excel
TAM	4000	Summa4
VDM	120	Industrial control computer + Dialogic E1 Cardx4
VDM	300	SunSPARC + Dialogic E1 Cardx13
FDM	30	Industrial control computer + Fax E1 Cardx1
FDM	120	Industrial control computer + Fax E1 Cardx4
DSM	120	CISCO AS5300
DSM	720	CISCO AS5800
DSM	7000	CISCO 7500
DSM	10000	CISCO GSR12000
NAM/LAM	3000	Main Street 3600
PSM	5000	APC 5KW UPS

All the equipment and configuration said above are only for an example and cannot be considered to restrict the invention. Those skilled in the art can use other adequate equipment and configuration.

Figure11 shows a logical structure diagrammatic drawing of the management unit MAU 102 of an embodiment. As shown in Figure11, the MAU unit includes three parts: information exchange module (NSM) 202, processing module 201 and power supply module 203. The NSM is responsible for the connection of network equipment in the unit, and for the network connection with other units. The PSM is responsible for providing the power to all equipment in the unit. The processing module is the kernel of the unit.

As shown in Figures 5 and 11, the MAU includes system resource management,

business resource management and management console. Among them, the system resource manager manages all the basic resource of ACU, APU and MAU. This guarantees the normal operation of the whole integrated information service platform. The system resource manager includes network management module (NMM) and system management module (SMM). The NMM is used for network equipment management of the integrated information service platform. The SMM is used for system management of the platform, such as operating system, database, application software, software service classification, accounting scheme, service flow, new service creation, service log and start/stop etc.

The business resource manager manages business service resource of ACU and APU. It includes user management module (UMM) and accounting management module (BMM). The BMM does accounting to the business user and business service provider, respectively, for all the chargeable service and deals with the billing.

The management console (MCC) is the general console of MAU. It applies three layers Client/Server application to control and manage all the management modules. It implements management interface with browser. The management function of MCC can be distributed to multiple management terminals by authorization.

Figures 12A-12B show the mutual relationship between management modules and the console of MAU of an embodiment, wherein the console makes integrated control of the four management modules said above. As shown in Figure 12B, the platform includes many databases, such as user information database (systems directory/member database), accounting information database (log/intermediate result/tariff), application system parameters (set/status) and system operation parameters (set/status). These databases store and process the user information, accounting information, application configuration information and configuration information of the system etc. By accessing the database, the middleware receives and provides data to user management module (UMM), accounting management module (BMM), system management module (SMM) and network management module (NMM). Finally, it makes the monitoring through the general console MCC.

Figure 12C shows a diagrammatic drawing of a software structure example of the management unit. The user database stores user data and service processing procedure and result. The said user data include user identification information, user authorization information and user account etc. The user identification information is a pre-allocated identification for each user. When the user is accessed to the platform system, at first, the management unit receives the user identification from access unit and then it authenticates this user identification with the one stored in the user database. In this way, the user identification and its authorization can be verified. The recording unit in Figure 12C is used for recording the service processing procedure and result to the database. The accounting unit is used for doing account for the chargeable service. The authentication and authorization units can be connected to a third party authentication center, which authenticates the user identification and authorization and returns the result to the said authentication unit.

Using the authentication unit mode or the third party authentication center mode to authenticate is to guarantee effectively the network security and information security. The network security technology and the information security technology themselves can use the existing technology and will not be detailed here.

Table5 shows the characteristics of a management unit for an embodiment.

Table5 MAU characteristics

Characteristics	Interface	Usage
NSM	4x100Base-T	Connect APU, ACU
MCC	WWW	MAU general console
NMM	WWW	Network management
SMM	WWW	System management
UMM	WWW	User management
BMM	WWW	Accounting management
PSM	220V	Power supply

The network communication channel of MAU is NSM. Except connection with the internal equipment of MAU, the NSM connects other external units and is used in cascade connection of MAU to expand system capacity and processing capability. The

NSM of MAU is same as the NSM of ACU.

Figure13 shows a diagrammatic drawing of the equipment connection of MAU for an embodiment. As shown in Figure13, the MAU is consisted of information exchange module (NSM), console module (MCC), system resource management (NMM and SMM), business resource management (UMM and BMM) and power supply module.

NSM and PSM are same as the corresponding modules of ACU.

There is one type of MCC: MCC1000. The MCC1000 is consisted in an industrial control Pentium PC, which applies Window NT operating system and runs the general console software or browser.

There is one type of UMM: UMM3000, its hardware configuration is same as NPM3000. It processes the user authentication, authorization requirement, proposed by access unit and application unit, makes records and statistics of the user operation.

There are two types of BMM: BMM3000 and BMM7000, the hardware configuration of them is same as NPM3000 and NPM77000, respectively. They are used for accounting of user and service in real time or in fixed time, then with the accounting result they control the authorization.

There is one type of NMM: NMM3000, its hardware configuration is same as NPM3000. It monitors and maintains the whole network, discovers the hardware and software hidden danger in time or by time, provides operation and maintenance record.

There is one type of SMM: SMM3000, its hardware configuration is same as NPM3000. It manages the system configuration information, user information, application flow chart information etc. for user server, application server and network management server.

Table6 shows an example of the MAU hardware configuration of an embodiment.

Table 6 MAU hardware configuration



Equipment name	Type	Configuration
NSM	2000	CISCO CATALYST2900
NSM	5000	CISCO CATALYST5000
MCC	1000	Industrial control computer + Windows NT
UMM	3000	Compaq Proliant 6500(rack) + Windows NT
BMM	3000	Compaq Proliant 6500(rack) + Windows NT
BMM	7000	Compaq Alpha Server 4100 + Windows NT
NMM	3000	Compaq Proliant 6500(rack) + Windows NT
SMM	3000	Compaq Proliant 6500(rack) + Windows NT
PSM	5000	APC 5KW UPS

All the equipment and configuration said above are only for an example and cannot be understood to restrict the invention. Those skilled in the art can use other adequate equipment and configuration.

Figure14 shows the logical structure diagrammatic drawing of application unit APU 103 of an embodiment. The APU unit includes three parts: the information exchange module (NSM) 202, processing module 201 and power supply module (PSM) 203. The NSM is responsible for the network equipment connection in the unit and for the network connection with other units. The PSM is responsible for the power supply of all the equipment in this unit. The processing module is the kernel of the unit.

As shown in Figure 15 and Figure 5, the processing module of APU is divided into three parts: outsourcing application, integrated application and navigation application.

The outsourcing application part includes the basic application module (BAM) of the integrated information service platform and the application module (HAM) outsourced by the business service provider. The BAM is a set of application modules, including WWW, email, FTP, News, Chat, Facsimile, Voice Hot Line, Call Center etc. The HAM is managed and maintained by the integrated information service platform according to the outsourcing business service provider, it includes such as Web server

outsource (virtual server), enterprise call center outsource and stock exchange business outsource etc.

The integrated application part is consisted in application integrated module (AIM). The AIM is middleware suite, which provides the integrated business service to the business service provider, who does not like the outsourcing service. The AIM integrates the services of the business service providers and brings them into the platform system. The integrated information service platform provides services to authorized user and through ACU supports the business service provider with such as doing account, settle account etc.

The navigation application parts is consisted in the navigation and characterized module (NPM) of the platform. The NPM provides navigation service for all the business resource, system resource and user helping resource of the platform, and provides individual service interface to the user according to the user habit and the information characteristics. The navigation services include voice navigation and WWW navigation.

Table7 shows the APU characteristics of an embodiment.

Table7 APU characteristics

Characteristics	Interface	Usage
Information exchange module	4x100Base-T	Connect MAU, ACU
NPM	WWW	Providing navigation and individualized service
BAM	WWW	Providing outsourcing service
HAM	WWW	Providing outsourcing service
AIM	WWW	Agent service for service provider
Power supply module	220V	Power supply

The network communication channel of APU is NSM. Except connection with the internal equipment of APU, the NSM connects with other external units and makes cascade connection of APU to expand system capacity and processing capability. The NSM of APU is same as the NSM of ACU.

Figure 15 shows the diagrammatic drawing of the APU equipment connection for an embodiment.

The APU is consisted of information exchange module NSM, service navigation module NPM, basic service module BAM, outsourcing service module HAM, application integrated module AIM and power supply module PSM. The NSM and PSM are same as corresponding modules, respectively, in ACU.

There are three types of NPM: NPM1000, NPM3000 and NPM7000. The NPM1000 is consisted in an industrial control PC server, which provides voice navigation and individualized service. The NPM3000 is consisted in a Compaq Proliant6500 server (rack), which provides WWW navigation and individualized service, uses Windows NT operating system, and supports 50-100 thousand users. The NPM7000 is consisted in a Compaq AlphaServer4100 server (rack), which provides WWW navigation and individualized service, uses Windows NT operating system and supports over 100 thousand users.

There are two types of BAM: BAM3000 and BAM7000. The hardware configuration of BAM3000 and BAM7000 is same as NPM3000 and NPM7000, respectively. They provide the most basic service for the integrated information service platform, including WWW, email, FTP, News, Chat, Voice Hot Line and Call Center etc.

There are two types of HAM: HAM 3000 and HAM7000. The hardware configuration of HAM3000 and HAM7000 is same as NPM3000 and NPM7000, respectively. They provide service outsourced by the business service provider, such as outsourcing Web site server computer (virtual site computer), business information announce, enterprise call center and stock market information announce, etc.

There are two types of AIM: AIM3000 and AIM7000. The hardware configuration of AIM3000 and AIM7000 is same as NPM3000 and NPM7000, respectively. They integrate with the application of business service provider and are responsible of the authentication, authorization, recording and doing account of user. The business service provider is responsible of the final processing of the service, such as network security

trading, network call center, network bank, network shopping and network booking etc.

Table8 shows the hardware configuration of APU for an embodiment.

Table8 APU hardware configuration

Equipment name	Type	Configuration
NSM	2000	CISCO CATALYST 2900
NSM	5000	CISCO CATALYST 5000
NPM	1000	Industrial control computer + Windows NT
NPM	3000	Compaq Proliant 6500 (rack) + Windows NT
NPM	7000	Compaq AlphaServer 4100 + Windows NT
BAM	3000	Compaq Proliant 6500 (rack) + Windows NT
BAM	7000	Compaq AlphaServer 4100 + Windows NT
HAM	3000	Compaq Proliant 6500 (rack) + Windows NT
HAM	7000	Compaq AlphaServer 4100 + Windows NT
AIM	3000	Compaq Proliant 6500 (rack) + Windows NT
AIM	7000	Compaq AlphaServer 4100 + Windows NT
PSM	5000	APC 5KW UPS

All the equipment and configuration said above are only for an example and cannot be understood to restrict the invention. Those skilled in the art can use other adequate equipment and configuration.

Different with the traditional two layers Client/Server application mode, the application of integrated information service platform is three layers or multiple layers Client/Server structure. Figure 16 shows a diagrammatic drawing of the application layer structure in an embodiment of the integrated information service platform.

The client layer is consisted in user terminal. When using computer, the Internet browser is used. For other terminal, its basic characteristic is used such as the voice and DTMF signal of telephone etc.

The intermediate layer is consisted of the gateway part of ACU, the business resource management of MAU and the NPM of APU.

The service layer is consisted of the BAM, HAM and AIM of APU, and the related agent service of business service provider.

Figure17 shows a diagrammatic drawing of characteristics of the middleware set for an embodiment. The management unit of the platform system includes multiple middleware, which is used to execute the basic management processing unrelated with the access terminal and specific service. The access unit includes multiple access middleware, which is used to execute the processing related to the access terminal. The application unit includes multiple service middleware, which processes a service and produces a processing result. The so-called middleware is a program or a module, which is reentrance and is used to produce the final user application. The middleware can be called and is responsible to solve the problems such as data portability and data security etc.

The said application program of access unit, management unit and application unit exists with the form of middleware, and forms an middleware set, which is the intermediate layer of the three layers or multiple layers Client/Server structure.

According to the invention, the application part of the platform is a series of software suite, i.e. middleware, which implements function of the integrated information service platform. The access middleware, together with the interface gateway of telecommunication access network, connects various telecommunication accesses to the platform data network. The management middleware provides, on the platform data network, basic and common management service to other middleware of the platform, such as user management, authority management, accounting management and application management etc. The application middleware implements, on the platform data network, certain special function or operation, based on the access middleware and management middleware. The special function can be such as based on Web videotext information announce, video information announce (real time or by request, broadcasting historical information), video conference (VC), WebChat, WebMail, WebNews, WebPaging, WebFax, bank transfer, pay on network etc.

Wherein, the platform application unit is an application system, which implements a relatively independent and integrated business. Usually, it is points to a field with series solutions. A specific end user can use the maintenance tool of the rapid application generation system to configure and maintain (generally, though the Web browser) them.

With this intermediate layer structure, the integrated information service platform can rapidly constructs and generates the final application system, simply and directly.

The integrated information service platform has many software function modules. The

Microsoft COM/DCOM distributed application architecture is used as the application specification for the whole integrated information service platform to guarantee the flexibility and expandability of the whole system.

From the application execution procedure, it can be seen that an application is consisted of many basic function units. Combining with these function units, a complete application flow is formed. Each function unit can complete and can only complete a specific action. Although, each unit is consisted of many statements and operations, but they are the smallest unit and cannot be divided again from the point of view of platform application.

Between different applications, there are a lot of basic function units are the same, such as user authentication, user authorization, user accounting, fund inquiry, information inquiry and bank transfer etc. Only few function units are dependent on a specific application. Therefore, in the integrated information service platform, the applications are divided into smaller function units, which forms software set called middleware suite. An application is an orderly collection of the members of the middleware set according to the business requirement.

Therefore, the application function of integrated information service platform is determined by the business service, the access terminal and the middleware suite. Any of the specific applications is a combination of these three elements, so it can be described by three-dimension space, such as a magic cube, as shown in Figure17. The application

function  $Mxyz = \text{business service (X)} \times \text{access terminal (Y)} \times \text{middleware (Z)}$ . Each square on the magic cube represents a characteristic of the integrated information service platform. Suppose service 3 represents security service, access terminal 2 represents telephone, middleware 2 represents user authentication and middleware 3 represents fund query. Then, M322 represents a user accesses to the platform by telephone and executes the user authentication of the security trading service, and M323 represents a user accesses the platform by telephone and executes the fund query of the security trading service.

The Mxyz represents a cube in the drawing. When  $X = 0$  and  $Y = 0$ , the M00Z represents the middleware without relation with the specific business and terminal, in other word the middleware with common feature of all application. When  $X \neq 0$  and  $Y \neq 0$ , the Mxyz represents the cube is consisted of  $M00Z + X \text{ business service} + Y \text{ access terminal}$ , and the Y is the access specification of the integrated information service platform.

Although, the platform application is a magic cube, which is consisted of the three elements; but for an access mode, the cubes, corresponding to the access terminal of the mode, have the same access characteristic, i.e. the same access specification.

The access specification is implemented at the intersection between different access terminal and a business service. It is necessary to specify the necessary input according to the different access terminal and different application. The input is transformed into an identical format, which can be called by the M00Z, and the result returned from M00Z is transformed to the format, which can be received by the access terminal.

For example, suppose that a user accesses to the platform to make the security trading with a telephone. What happen? The access middleware deals with the telephone access. The management middleware, including authentication, accounting and recording middleware, deal with the authentication, accounting and recording, which are independent of the specific service and access terminal. The security trading service middleware preliminarily deals with the security trading service and then transfers to the security service system, and returns the result to the user. All the application program of

the modules can be formed in the middleware form.

Figure18 shows a flowchart of the business service. The ACU of integrated information service platform accesses various kinds of terminal and unifies the protocols into one, such as TCP/IP, by the gateway in it. In this way, a user can input the information and get the result only with the terminal. Specifically, the procedure is as following. The user inputs its requirement through the access unit. The UMM of management unit authenticates the user identification and authorization for the service required by the user. If the user is authorized for this service, then the user can select and use the service in a navigation and individualized interface. The business service procedure is: identity authentication → authorization → navigation and individualization → servicing, each operation is recorded in the log database for accounting and statistic purposes.

In an embodiment of the invention, all of the software modules are in COM form. The mutual call procedures between modules are implemented with the DCOM standard.

The Microsoft COM/DCOM specification is a mature technology. As the Windows platform occupies the market leading position, the COM/DCOM is a de facto standard. Microsoft promises that the COM/DCOM is a heterogeneous platform solution. At present, it is implemented on the Sun Solaris platform; for Digital Unix and DEC Open VMS platform, it is at the Beta version stage; for HP-UX, SGI IRIX, IBM AIX, it is in the planning stage. In addition, the third party software vendors implement COM/DCOM on the non-Windows platform, such as the Software AG sales a COM/DCOM implementation Entire X, which supports the following platforms: Sun Solaris, Digital Unix (64 bits), HP-UX, AIX, Linux, OS/390 (MVS Open Edition), BS2000 and VSE etc., especially the Entire X for Linux is a freeware.

If the integrated information service platform needs to connect with the platform without implementing the COM/DCOM specification, the bridging technology can be used. At present, except COM/DCOM, the object oriented component implementation mainly is the CORBA technology of OMG. The third party software vendor has sold the transparent bridging tool of them.



In an embodiment of the invention, all the units of the platform use the industrial standards. Every unit can be in cascade connection to expand the system capacity. The console can be located inside the unit or outside the unit. When the console is set outside the unit, it should care the static electricity and stability of the console.

Figure19 shows a diagrammatic drawing of an embodiment with three city platforms. As shown in Figure19, the cities A, B and C set up the integrated information service platform based on the metropolitan telecommunication network. The connection between platforms is fiber with ATM mode. When a user moves from City A to City B, he requires the access to the local platform. The local platform proposes the authentication of the user's identity to the platform where the user opens his account. The result of the authentication returns to the local platform and the user. Then, the user can get the service through the local platform. The user can also get the service from the platform where he opens his account or other platforms.

### Industrial Practicability

In summary of the above description, the integrated information service platform system of the invention takes the metropolitan area as its basic service area. The platform sets a united access, management and application platform of information service based on the communication basic platform (telecommunication or other public communication platform). The platform has integration and mechanism feature. Through outsourcing mechanism, the platform provides outsourcing service to the business service provider. Through service agent mechanism, the platform provides rapid formal business service to the business service provider. The platform provides integrated service to the user or customer, such as security authentication, authorization, transaction, trading, office business, shopping, security trading and clearing management etc.

The integrated information service platform makes the telecommunication service deeper. The platform not only provides value-added service rapidly, but more importantly provides a high-speed business service platform as well. With the platform, the business service provider can implement or outsource the service rapidly; the user can easily use

all kind of access mode and access terminal to get information and service. In this way, the traditional telecommunication service can be value-added, the business service is more professional, cheaper and popular, the consumer is happier and easier.

Except setting up advanced large electronic commerce system, the integrated information service platform can also be used to connect and unite various service systems. The various service system can be such as computer service system or voice special service system, for example the 163/169, 168/160/180/189 in China, and the new service system: ISDN service, broadband multimedia service and Cable TV data service etc.

The integrated information service platform is an electronic commerce platform for exchanging various information and service. It provides an integrated management for various kinds of users. It systematically solves the integration problems of access, management and application, which forms the sectors of a chain between the business service provider and consumer. From the user's points of view, the user is not necessary to concern the physical layer, such as transmission network, exchange network and access network etc., or even the terminal and application. The user is only necessary to concentrate the concerning to what he really want: information and service. From the business service provider points of view, the service provider is not necessary to concern about the system resource management, user management, accounting management, navigation management and the user access etc. The business service provider can concentrate on the information supply and service development. From the telecom service provider points of view, through the integrated information service platform, almost all the basic networks can be integrated by the service. This makes the telecommunication service have a new and big development space.

The said above are the preferred embodiments only. It should be understood that the scope of the invention is not limited by them. Professional of the art can make modification and type changing within the spirit and scope of the invention; all of these should be covered in the claims of the invention.

## claims

1. A integrated information service platform system, comprising:

an access unit, connecting with user terminal through transmission network, providing user accesses to the system with multiple access modes, receiving user service requirement proposed through the transmission network and transforming the service requirement to a unified data format, and connecting with various service provider systems through transmission network, wherein the user has an identification code;

a management unit, managing and controlling the operation of every part of the platform system with an identified interface, receiving the unified format data come from the access unit, authenticating a user identification and authorization according to the identification code;

an application unit, including at least one middleware, which is used to execute processing function, selecting adequate middleware to deal with the said service requirement and returning the result to user through the said access unit and transmission network;

wherein the said access unit, management unit and application unit are connected with each other for data transmission and providing service.

2. According to claim 1, the said integrated information service platform system, it is characterized with: the said platform system is based on the Internet or Intranet.

3. According to claim 2, the said integrated information service platform system, it is characterized with: the said management unit includes multiple management middleware, which are responsible to deal with the basic management function, which is common to all services; the said access unit includes multiple access middleware, which are used to operate the processing related to the access terminal; the said application unit includes multiple service middleware, which executes a certain service processing.

4. According to claim 3, the said integrated information service platform system, it is characterized with: wherein said processing related to the access terminal includes mutual communication with user terminal, reception data and transformation data.

5. According to claim 4, the said integrated information service platform system, it is characterized with: wherein said service processing includes the processing of user requirement, which corresponds to different type of service and service provided by different service provider.

6. According to claim 5, the said integrated information service platform system, it is characterized with: wherein said management unit includes at least one database; the database is used to store user data, procedure of service processing and result of service processing; the said user data includes user identification information, user authorization information and user accounting information etc.

7. According to claim 6, the said integrated information service platform system, it is characterized with: wherein said management unit includes authentication unit, record unit and accounting unit. the authentication unit authenticates the user identification and authorization according to the user identification and authorization information stored in the said database before; the record unit stores the service processing procedure and result in said database; the accounting unit does account according to the service shared by the user with the charge standard defined before; the application program of the said units exists with middleware form.

8. According to claim 7, the said integrated information service platform system, it is characterized with: wherein said user terminal includes computer, telephone, facsimile, mobile telephone, PDA, TV and pager etc.; wherein said user access transmission network includes computer network, telecommunication network and broadcast and television network based on the basic transmission network.

9. According to claim 8, the said integrated information service platform system, it is characterized with: wherein said transmission network of service provider includes leased line network based on basic transmission network and virtual leased line network.

10. According to claim 9, the said integrated information service platform system, it is characterized with: wherein said access unit includes access information exchange part, multiple access processing part and gateway transformation part; each of the multiple access processing part receives input signal and data from different kind of transmission network and returns the processing result; the gateway transformation part

transforms input signal and data, received by said access processing part, to a unified data format and vice versa; wherein said information exchange part receives the output, with unique data format, of gateway transformation part, returns processing result and connects with management unit and application unit for data transmission.

11. According to claim 10, the said integrated information service platform system, it is characterized with: wherein said access processing part includes PSTN/ISDN access module (TAM), computer network access module (LAM) and broadcast and television network access module (NAM); they are used to receive signal or information and return processing result from telecommunication and telephone network, computer network and broadcast and television network, respectively.

12. According to claim 11, the said integrated information service platform system, it is characterized with: wherein said gateway transformation module includes telephone voice/data module (VDM), facsimile/data module (FDM) and data service module (DSM); the VDM transforms DTMF signal come from telephone, to a unified data format command and requirement and the processing result to voice returning to the user; the FDM transform the DTMF signal and G3/G4 command, come from facsimile, to a unified data format command and requirement and the processing result to G3/G4 facsimile returning to the user; the DSM is used to connect with computer or computer network for data transmission. In addition, the said PSTN/ISDN access module (TAM) identifies the user terminal; if it is a telephone, then it is transferred to telephone voice/data module (VDM); if it is a facsimile, then it is transferred to facsimile/data module (FDM); if it is a computer or computer network, then it is transferred to data service module (DSM).

13. According to claim 12, the said integrated information service platform system, it is characterized that: the application program of every parts or modules of wherein said access unit exists in middleware form.

14. According to claims 1, the said integrated information service platform system, it is characterized with: wherein said application unit includes a preliminary processing part; the preliminary processing part makes the preliminary processing of the user requirement, then transfer to service provider system, through access unit and transmission network of service provider, for service processing; the processing result is

transferred to the user through the said access unit and transmission network of service provider.

15. According to claim 14, the said integrated information service platform system, it is characterized with: wherein said management unit includes a information exchange part, a user management part (UMM), an accounting management module (BMM), network management module (NMM), system management module (SMM) and console management (MCC); the said information exchange part exchanges data with the said access unit and application unit; the UMM manages user and user attributes, it includes the said authentication unit, which manages user account creation, deletion, authentication, browsing and business statistics etc; the BMM includes the said accounting unit, which does account for all the chargeable service for the business user and service provider and deals with billing; the NMM manages network equipment of the platform system; the SMM manages operating system, database, other system resources and services, provided by the platform, including service classification, scheme of accounting etc; the MCC controls and manages the said management modules.

16. According to claim 15, the said integrated information service platform system, it is characterized with: wherein said application unit includes an information exchange part, a basic application module (BAM), a outsourced application module (HAM), an application integrated module (AIM) and a navigation and individualized module (NPM); the said information exchange part exchanges data with the said access unit and management unit; the BAM provides one or multiple service of followings: WWW, EMAIL, FTP, NEWS, CHAT, FACSIMILE, VOICE HOT LINE and CALL CENTER; the HAM provides management service, outsourced by the business service provider, with identified interface; the AIM, including the said preliminary processing part, provides identified management to non-outsourcing service provider and makes preliminary processing to user requirement; the NPM, including voice navigation and WWW navigation, selects personal service interface according to user habit.

17. According to claim 16, the said integrated information service platform system, it is characterized with: wherein said access unit, management unit and application unit are mutually connected with internal high-speed bus.

18. According to claim 17, the said integrated information service platform

system, it is characterized with: wherein said multiple integrated information service platform systems with metropolitan area level are connected with communication network; this makes users possible to connect with any platform at any place and to share the service provided by any connected platform.

19. According to claim 1, the said integrated information service platform system, it is characterized with: wherein said user terminal includes computer, telephone, facsimile, mobile telephone, PDA, TV and pager etc.; wherein said user access transmission network includes computer network, telecommunication network and broadcast and television network based on the basic transmission network.

20. According to claim 19, the said integrated information service platform system, it is characterized with: wherein said transmission network of service provider includes leased line network, including virtual leased line network, based on basic transmission network.

21. According to claim 20, the said integrated information service platform system, it is characterized with: wherein said access unit includes access information exchange part, multiple access processing part and gateway transformation part; each of the multiple access processing part receives input signal and data from different kind of transmission network and returns the processing result; the gateway transformation part transforms input signal and data, received by said access processing part, to a unified data format and vice versa; wherein said information exchange part receives the output, with unique data format, of gateway transformation part, returns the processing result and connects with management unit and application unit for data transmission.

22. According to claim 21, the said integrated information service platform system, it is characterized with: wherein said access processing part includes PSTN/ISDN access module (TAM), computer network access module (LAM) and broadcast and television network access module (NAM); they are used to receive signal or information from telecommunication and telephone network, computer network and broadcast and television network, respectively.

23. According to claim 22, the said integrated information service platform system, it is characterized with: wherein said gateway transformation module includes telephone voice/data module (VDM), facsimile/data module (FDM) and data service

module (DSM); the VDM transforms DTMF signal come from telephone, to a unified data format command and requirement and the processing result to voice returning to the user; the FDM transform the DTMF signal and G3/G4 command, come from facsimile, to a unified data format command and requirement and the processing result to G3/G4 facsimile returning to the user, the DSM is used to connect with computer or computer network for data transmission; in addition, the said PSTN/ISDN access module (TAM) identifies the user terminal; if it is a telephone, then it is transferred to telephone voice/data module (VDM); if it is a facsimile, then it is transferred to facsimile/data module (FDM); if it is a computer or computer network, then it is transferred to data service module (DSM).

24. According to claim 23, the said integrated information service platform system, it is characterized with: wherein said management unit includes a information exchange part, a user management part (UMM), an accounting management module (BMM), network management module (NMM), system management module (SMM) and console management (MCC); the said information exchange part exchanges data with the said access unit and application unit; the UMM manages user, user attributes, user account creation, deletion, authentication, browsing and business statistics etc; the BMM does account for all the chargeable service for the business user and service provider and deals with billing; the NMM manages network equipment of the platform system; the SMM manages operating system, database, other system resources and services, provided by the platform, including service classification, scheme of doing account etc; the MCC controls and manages the said management modules.

25. According to claim 24, the said integrated information service platform system, it is characterized with: wherein said application unit includes an information exchange part, a basic application module (BAM), a outsourcing application module (HAM), an application integrated module (AIM) and a navigation and individualized module (NPM); the said information exchange part exchanges data with the said access unit and management unit; the BAM provides one or multiple services of the followings: WWW, EMAIL, FTP, NEWS, CHAT, FACSIMILE, VOICE HOT LINE and USER CALL CENTER; the HAM provides management service, outsourced by the business service provider, with identified interface; the AIM, provides identified management to



non-outsourcing service provider and makes preliminary processing to user requirement; the NPM, including voice navigation and WWW navigation, selects personal service interface according to user habit.

26. According to claim 25, the said integrated information service platform system, it is characterized with: wherein said access unit, management unit and application unit are mutually connected with internal high-speed bus.

27. According to claim 26, the said integrated information service platform system, it is characterized with: wherein said multiple integrated information service platform systems with metropolitan area level are connected with communication network; this makes users possible to connect with any platform at any place and to share the service provided by any connected platform.

28. A method of providing the integrated information service platform, comprising:

access multiple users, each user has an identification code, with various access modes, receive service requirements from user terminal through transmission network, transform the service requirement to a unified data format, connect to service provider system through transmission network for data transmission;

manage and control the application and operation with an identified interface, receive the said unified format data, authenticate a user identification and authorization according to the user identification code;

provide at least one middleware, each of which implements an application processing function; selects adequate middleware for each service requirement proposed by user, who has passed the authentication and returns the processing result to user.

29. According to claim 28, the said method providing integrated information service platform, it is characterized with: wherein said platform is based on Internet or Intranet.

30. According to claim 29, the said method providing integrated information service platform, it is characterized with: wherein said processing related to access terminal includes interaction, receiving and transformation with user terminal.

31. According to claim 30, the said method providing integrated information service platform, it is characterized with: wherein said service processing includes

processing of different types of services and services provided by different service providers; the application program corresponding to various service processing exists in middleware form and forms the service middleware.

32. According to claim 31, the said method providing integrated information service platform, it is characterized with: wherein said management steps also include storing the user data and service processing procedure and result in a database; the said user data include user identification information, user authorization information and user accounting information etc.

33. According to claim 32, the said method providing integrated information service platform, it is characterized with: wherein said management steps also include:

authenticating the user identification and authorization according to the user identification and authorization information stored in the said database before;

storing the service processing procedure and result in said database;

accounting according to the service shared by the user with the charge standard defined before;

the application program of the said steps above exists in middleware form and forms the management middleware.

34. According to claim 33, the said method providing integrated information service platform, it is characterized with: wherein said user terminal includes computer, telephone, facsimile, mobile telephone, PDA, television and pager etc.; wherein said user access transmission network includes computer network, telecommunication network and broadcast and television network based on the basic transmission network.

35. According to claim 34, the said method providing integrated information service platform, it is characterized with: wherein said transmission network of service provider includes leased line network, including virtual leased line network, based on basic transmission network.

36. According to claim 35, the said method of providing integrated information service platform, it is characterized with: the application program of wherein said access steps exists in middleware form and forms the access middleware.

37. According to claims 28, the said method of providing integrated information service platform, it is characterized with: wherein said application processing

steps include a preliminary processing step; the preliminary processing step makes the preliminary processing of the user requirement, then transfer to service provider system, through access unit and transmission network of service provider, for service processing; the processing result is transferred to the user through the said access unit and transmission network of service provider.

38. According to claim 37, the said method providing integrated information service platform, it is characterized with: the following steps: providing said multiple integrated information service platforms with metropolitan area level are connected with communication network; this makes users possible to connect with any platform at any place and to share the service provided by any connected platform.

39. According to claims 1, the said integrated information service platform system, it is characterized with: wherein said unique data format is IP data.

40. According to claims 28, the said method providing integrated information service platform, it is characterized with: wherein said unique data format is IP data.

## Abstract

This invention discloses a integrated information service platform system and method thereof, comprising: an access unit, connecting with user terminal and service provider processing system through transmission network, allowing a plurality of user terminals to be accessibla for accepting the service request from users and converting the request into platform uniform data; a management unit, managing with an identified interface, receiving the unified format data come from the access unit and making the verification and authorization of users; an application unit, component which executes predetermined application processing functions, selecting a middleware corresponding to a service request for processing, returning a processed result to the access unit for conversion, and then to the user. The system is based on Internet or Intranet, realizes the uniform access, management and application, making information service being no longer limited by time, region and access way.

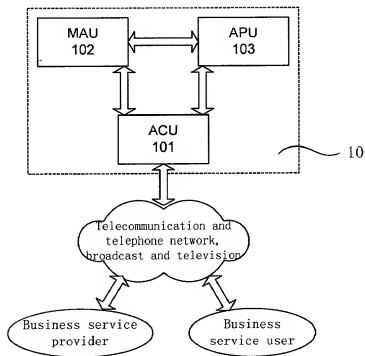


Fig. 1A

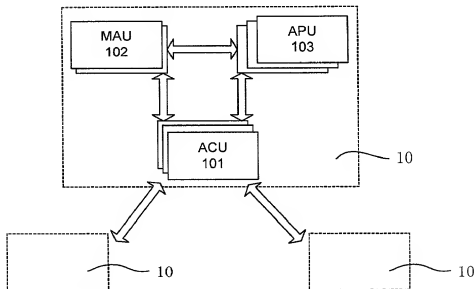


Fig. 1B

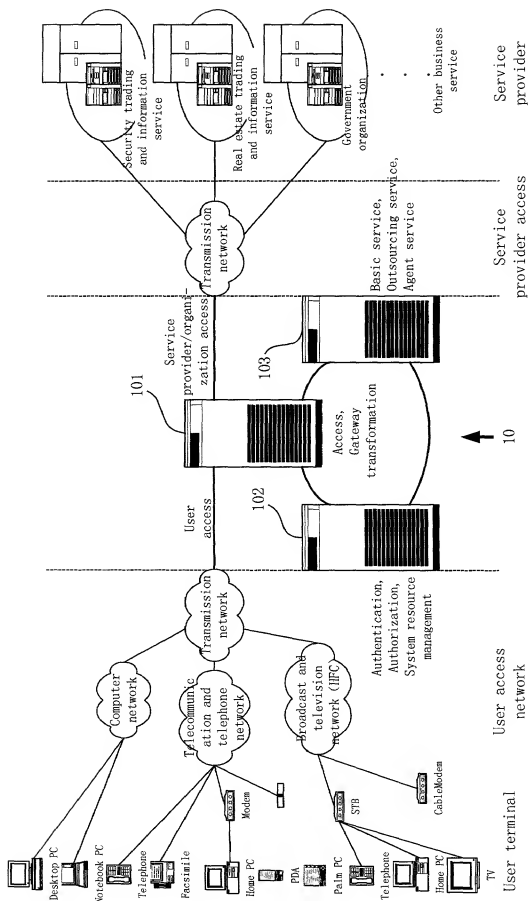


Fig. 2

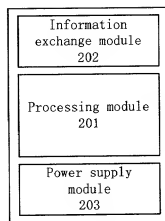


Fig. 3

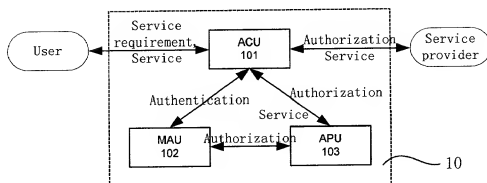


Fig. 4

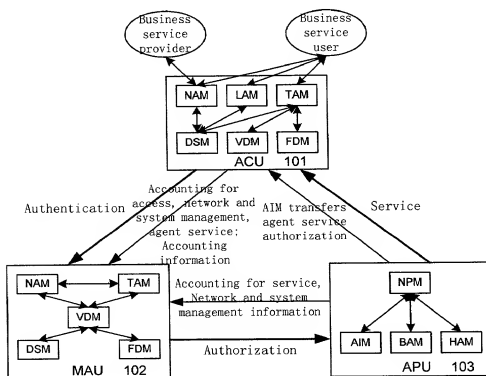


Fig. 5

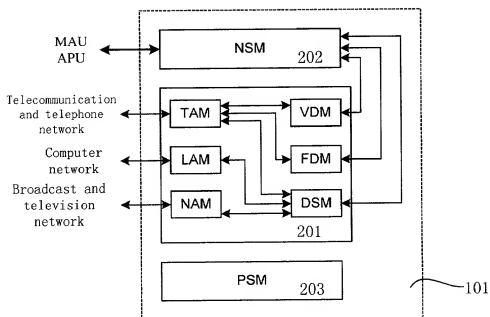


Fig.6

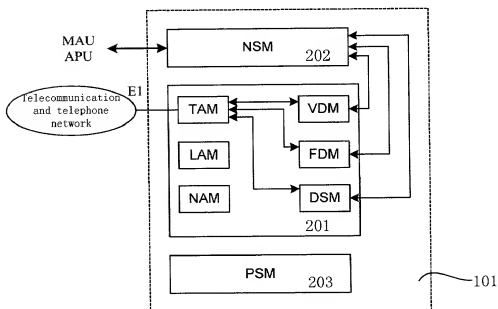


Fig.7



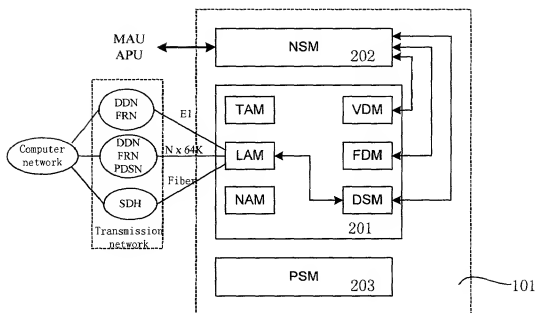


Fig.8

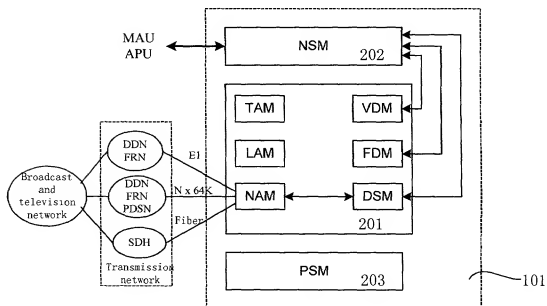


Fig.9

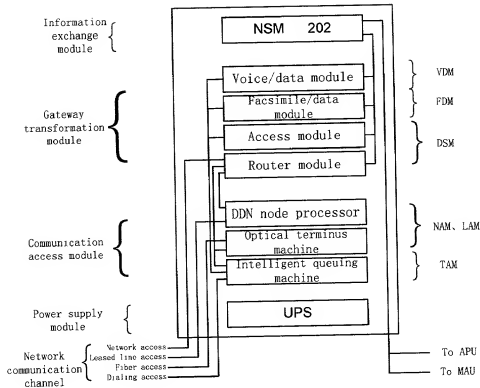


Fig.10

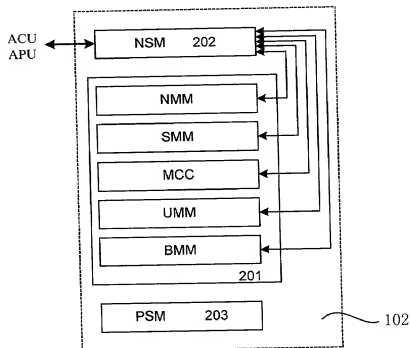


Fig.11

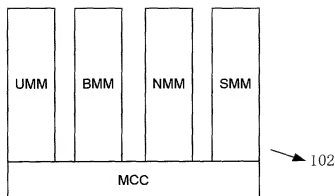


Fig. 12A

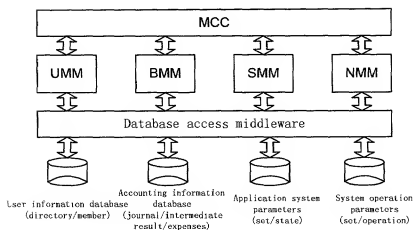


Fig. 12B

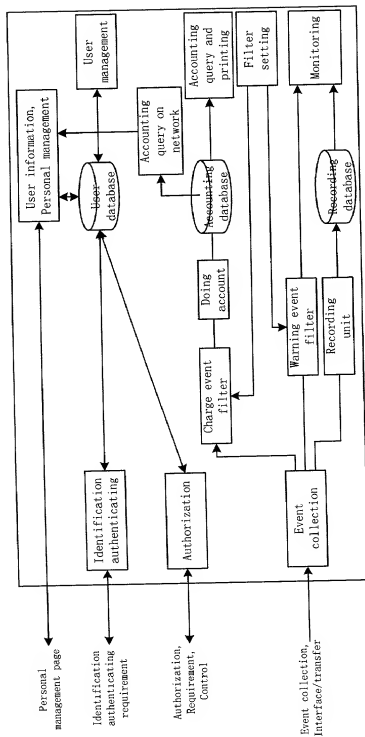


Fig. 12C

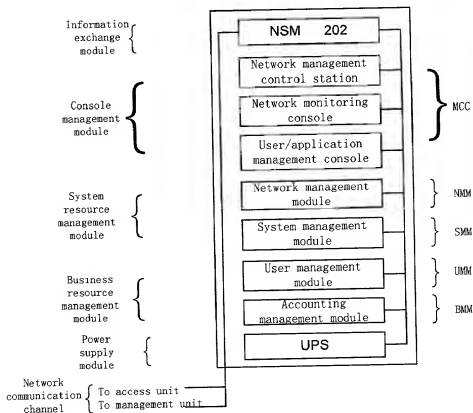


Fig.13

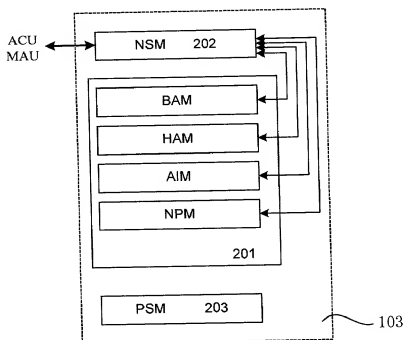


Fig.14



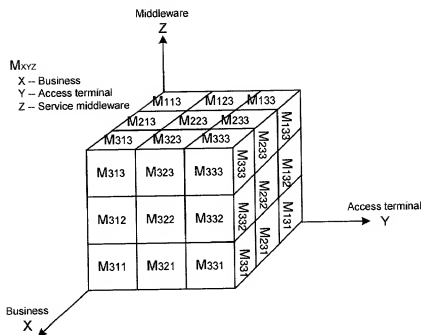


Fig.17

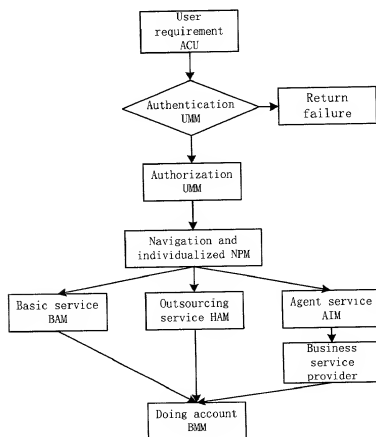


Fig.18

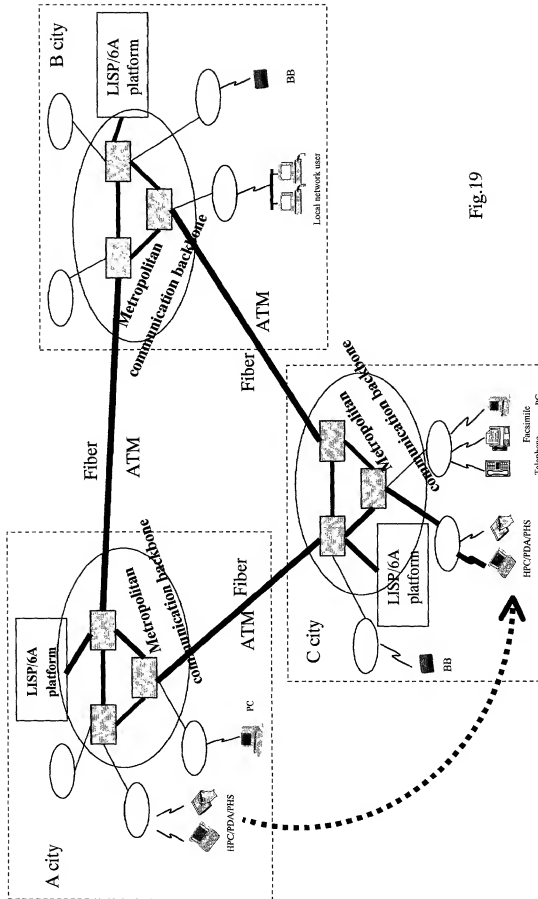


Fig.19



Attorney's Docket No.: DEQL0002-US (OP01US01:P)

**PATENT****DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

**INTEGRATED INFORMATION SERVICE PLATFORM  
SYSTEM AND METHOD THEREOF**

the specification of which

<input type="checkbox"/>	is attached hereto.
<input checked="" type="checkbox"/>	was filed on <u>11/23/1999</u> as
<input type="checkbox"/>	United States Application Number _____
<input type="checkbox"/>	or PCT International Application Number <u>PCT/CN99/00200</u>
<input type="checkbox"/>	and was amended on _____
	(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above. I do not know and do not believe that the claimed invention was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months (for a utility patent application) or six months (for a design patent application) prior to this application.

I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d), of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):		Priority Claimed	
CN98124959.4	China	11/23/1998	X
Number	(Country)	(Day/Month/Year Filed)	Yes No
PCT/CN99/00200	PCT	11/23/1999	X
Number	(Country)	(Day/Month/Year Filed)	Yes No
Number	(Country)	(Day/Month/Year Filed)	Yes No

I hereby claim the benefit under title 35, United States Code, Section 119(e) of the United States provisional application(s) listed below:

(Application Number)

(Filing Date)

(Application Number)

(Filing Date)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Number)

Filing Date

(Status-patented, pending, abandoned)

(Application Number)

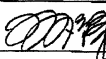

Filing Date

(Status-patented, pending, abandoned)

I hereby appoint Timothy N. Trop, Reg. No. 28,994; Fred G. Pruner, Jr., Reg. No. 40,779 and Dan C. Hu, Reg. No. 40,025 my patent attorneys, of TROP, PRUNER & HU, P.C., with offices located at 8554 Katy Freeway, Ste. 100, Houston, TX 77024, telephone (713) 468-8880; with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

Send correspondence to Timothy N. Trop, TROP, PRUNER & HU, P.C., 8554 Katy Freeway, Ste. 100, Houston, TX 77024-1805 and direct telephone calls to Timothy N. Trop, (713) 468-8880.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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